

CLAIMS

1. An ignition arrangement for a barrel assembly including a barrel having a plurality of projectiles axially stacked within the barrel together with respective
5 propellant charges for discharging the projectiles sequentially from the barrel, said ignition arrangement including:

a cavity provided in a body of each projectile, wherein the cavity communicates both forwardly and rearwardly of the projectile body; and

10 a fuse disposed in the cavity, which fuse includes a section formulated to burn at a predetermined rate;

whereby, in use, said fuse burns in the cavity to cause ignition of the propellant charge associated with said projectile.

2. The ignition arrangement of claim 1 wherein said forward
15 communication of the cavity allows burning of said fuse to be triggered by combustion of a forward propellant charge associated with an immediately preceding projectile in the axial stack of projectiles during discharge of said preceding projectile.

3. The ignition arrangement of either claim 1 or claim 2 wherein the fuse is
20 elongate and comprises three sections, a forward section, a rear section and an intermediate section.

4. The ignition arrangement of claim 3 wherein the intermediate section of
25 the fuse contains a fuse material formulated for burning at a predetermined longitudinal rate or velocity.

5. The ignition arrangement of either claim 3 or claim 4 wherein the
forward section of the fuse is composed of a fuse material ignitable by combusting
propellant, which ignited forward section can, in turn, ignite the intermediate section
30 of said fuse.

6. The ignition arrangement of any one of claims 3 to 5 wherein the forward section of the fuse contained in the forwardmost projectile in the barrel is electrically ignited or mechanically ignited.

5 7. The ignition arrangement of any one of claims 3 to 6 wherein the intermediate section is composed of a fuse material selected to burn at a pre-determined longitudinal velocity and, at or shortly before conclusion of the intermediate material burn, the intermediate section will ignite the rear section of the fuse.

10 8. The ignition arrangement of any one of claims 3 to 7 wherein the fuse material of the intermediate section provides a sealing function, whereby the burnt material of the intermediate section provides at least a partial seal within the cavity.

15 9. The ignition arrangement of any one of claims 3 to 8 wherein the rear section of the fuse, is composed of a fuse material that is ignitable by the burning intermediate section and is able, in turn, to ignite the associated propellant charge.

20 10. The ignition arrangement of any preceding claim wherein the fuse includes a rigid sleeve containing fuse material.

11. The ignition arrangement of claim 10 wherein the rigid sleeve is retained within the cavity provided in the body of the projectile.

25 12. The ignition arrangement of claim 4 wherein the pre-determined longitudinal burn velocity is calculated with reference to a desired period of time between ignition of propellant charges in said axial stack of projectiles.

30 13. The ignition arrangement of any one of claims 1 to 12 wherein the projectile body is provided with a first aperture that communicates between the cavity and forwardly of said projectile body, and a second aperture that communicates between the cavity and rearwardly of the projectile body.

14. The ignition arrangement of claim 13 wherein the cavity is aligned with a longitudinal axis of the projectile.

5 15. The ignition arrangement of either claim 13 or claim 14 wherein said first aperture and said second aperture are generally restricted in size compared with the internal diameter of the cavity.

10 16. The ignition arrangement of any one of claims 13 to 15 wherein the first aperture is arranged to enable ignition of said forward section of the fuse by combusting propellant of an immediately preceding projectile in said axial stack.

15 17. The ignition arrangement of any one of claims 13 to 15 wherein the second aperture is arranged to enable ignition of an associated propellant charge by the burning rear section of the fuse.

20 18. A projectile including a body having a cavity containing a fuse, said fuse including material formulated to burn at a predetermined rate, and wherein the projectile is provided with a first aperture that communicates between the cavity and forwardly of said projectile body and a second aperture that communicates between the cavity and rearwardly of the projectile body.

19. The projectile of claim 18 wherein the fuse include a rigid sleeve containing the fuse material.

25 20. The projectile of either claim 18 or claim 19 wherein the projectile body comprises at least two separate components to facilitate convenient insertion of the fuse into the cavity.

30 21. The projectile of claim 20 wherein said separate components are coupled together subsequent to fuse insertion thereby retaining the fuse within the projectile body.

22. The projectile of either claim 18 or 19 wherein the rigid sleeve is retained within the cavity of the projectile body.

23. The projectile of any one of claims 18 to 22 wherein said projectile body includes a head member and a tail member, which tail member includes a trailing skirt portion.

24. The projectile of claim 23 wherein the propellant charge is suitably formed as a block and is contained within the trailing skirt portion.

25. The projectile of either claim 23 or 24 wherein the skirt portion, in use, is engaged by a mandrel for urging an outer face of the trailing skirt portion into operative sealing engagement with the bore of the barrel.

26. The projectile of claim 25 wherein the mandrel is formed by either the propellant charge or by the head member of an adjacent trailing projectile.

27. The projectile of any one of claims 23 to 26 wherein a nose portion of an adjacent trailing projectile is urged into operative sealing engagement with an inner end face of the trailing skirt portion.

28. A method of igniting a plurality of propellant charges associated with respective projectiles axially stacked with a barrel, wherein a fuse is disposed in a cavity provided in a body of each projectile, and wherein the projectile is provided with a first aperture that communicates between the cavity and forwardly of said projectile body and a second aperture that communicates between the cavity and rearwardly of the projectile body, said method including the steps of:

igniting the fuse in the leading or forwardmost projectile in the barrel whereby, said fuse burns at a predetermined rate in the cavity to cause ignition of the propellant charge associated with said projectile;

which ignited propellant charge discharges the leading projectile from the barrel and ignites the fuse contained in the next adjacent projectile in said stack;

whereby the remaining projectiles of said plurality of projectiles are subsequently discharged from the barrel in sequence.

29. A barrel assembly including a barrel having a plurality of projectiles axially stacked within the barrel together with respective propellant charges for discharging the projectiles sequentially from the barrel, said barrel assembly characterised by an ignition arrangement as claimed in any one or more of claims 1 to 16.

30. A weapon including a cluster of barrel assemblies, each barrel assembly having a plurality of projectiles stacked within the barrel together with respective propellant charges for discharging the projectiles sequentially from the barrel, wherein each of said plurality of projectiles is as claimed in any one or more of claims 18 to 27.